

**843.2.02 Nonreinforced Concrete Pipe****A. Requirements**

## 1. Type

Use nonreinforced concrete pipe to convey sewage, industrial waste, and storm water that meets the requirements of AASHTO M 86 (M 86M), Class II, with the following changes:

Material	Requirements	Other Modifications
Coarse aggregate	Subsection 800.2.01	Gradation requirements do not apply
Fine aggregate	Subsection 801.2.02	Gradation requirements do not apply
Fly ash	Subsection 831.2.03.A	None
Water	Subsection 880.2.01	None

**B. Fabrication**

General Provisions 101 through 150.

**C. Acceptance**

Test and inspect with GDT 16.

**D. Materials Warranty**

General Provisions 101 through 150.

**843.2.03 Concrete Underdrain Pipe****A. Requirements**

## 1. Type

Use concrete underdrain pipe that meets the requirements of AASHTO M 175 (M 175M) or AASHTO M 176 (M 176M), with the following changes unless the Plans state otherwise:

Material	Requirements	Other Modifications
Coarse aggregate	Subsection 800.2.01	Gradation requirements do not apply
Fine aggregate*	Subsection 801.2.02	Gradation requirements do not apply
Fly ash	Subsection 831.2.03.A	None
Water	Subsection 880.2.01	None
*Use fine aggregate in standard strength, perforated, nonreinforced concrete underdrain pipe.		

**B. Fabrication**

General Provisions 101 through 150.

**C. Acceptance**

Test and inspect with GDT 16.

**D. Materials Warranty**

General Provisions 101 through 150.

**Section 844—Steel Pipe****844.1 General Description**

This section includes the requirements for the following types of steel pipe and related materials:

- Corrugated steel culvert pipe and pipe arches

- Bituminous-coated corrugated steel culvert
- Steel structural plate for pipe arches and arches
- Corrugated steel underdrain
- Precoated, galvanized, steel culvert
- Aluminum-coated (Type 2) corrugated steel

#### **844.1.01 Related References**

##### **A. Standard Specifications**

General Provisions 101 through 150.

##### **B. Referenced Documents**

- AASHTO M 36M
- AASHTO M 167M
- AASHTO M 190M
- AASHTO M 243M
- AASHTO M 245M
- AASHTO M 274M
- ASTM A849
- ASTM A862/A862M

### **844.2 Materials**

Repair any damaged coatings on the steel pipe according to AASHTO M 243M.

#### **844.2.01 Corrugated Steel Culvert Pipe and Pipe Arches**

##### **A. Requirements**

###### **1. Type**

Use corrugated steel culvert pipe and pipe arches that meet the requirements of AASHTO M 36M, Type I or II culvert pipe for dimensions and thicknesses, except as follows:

- Modify AASHTO M 36M, Section 9 to connect all slope drain pipe (except temporary slope drain pipe) with standard one- or two-piece bands. Use bands that completely engage at least one corrugation on each side of the joint or elbow section.
- Use connecting bands with projections as described in AASHTO M 36M, Section 9, for temporary slope drain, storm drain, and side drain pipe.
- Use special sections for these conduits, such as elbows and flared ends, that are of the same plate thickness as the conduit to which they are joined, and meet the applicable requirements of AASHTO M 36M, as modified.

##### **B. Fabrication**

Furnish shop-formed elliptical pipe and shop-strutted pipe where specified.

##### **C. Acceptance**

See the requirements of AASHTO M 36M.

##### **D. Materials Warranty**

General Provisions 101 through 150.

#### **844.2.02 Bituminous Coated Corrugated Steel Culvert Pipe**

##### **A. Requirements**

###### **1. Type**

Use bituminous-coated corrugated steel pipe that meets the requirements of AASHTO M 190M, ASTM A849, and ASTM A862/A862M for the sectional dimensions, plate thickness, and type of bituminous coating.

- a. Use special sections for these conduits, such as elbows and flared ends, that are the same plate thickness as the conduit to which they are joined and meet the applicable requirements of AASHTO M 190M, ASTM A849, and ASTM A862/A862M.
- b. Provide paved inverts (when required) that conform to the listed specifications.
- c. AASHTO M190M and ASTM A849 both contain bituminous material specifications, coating types and coating thickness requirements. Use the requirements of AASHTO M190M when there are discrepancies between the specification requirements.
- d. Use the ASTM 862/A862M requirements for post application of coatings.

**B. Fabrication**

1. Fully coat coupling bands and special sections, such as elbows, flared end sections and safety end sections with bituminous material.
2. Furnish shop-formed elliptical pipe and shop-strutted pipe where specified.

**C. Acceptance**

See the requirements of AASHTO M 190M.

**D. Materials Warranty**

General Provisions 101 through 150.

**844.2.03 Steel Structural Plate for Pipe Arches and Arches**

**A. Requirements**

1. Type  
Use structural plates and galvanized corrugated steel for the corrugated steel plate pipe, pipe arches, and arches that meet the requirements of AASHTO M 167M, AASHTO M 36M, and the following requirements, when applicable:
  - a. Bituminous Coating: When bituminous coating is specified, use a coating that meets the requirements of AASHTO M 190M for the type specified.
  - b. Galvanized Corrugated Plates for Pipe: Pipe, pipe arch, and arches may be constructed from corrugated galvanized sheets or plates.

**B. Fabrication**

1. Bituminous Coating  
After erecting the structure, but before placing any backfill, replace any coating that was removed or damaged during erection, either inside or outside, with bituminous material meeting Subsection 844.2.02.
2. Galvanized Corrugated Plates for Pipe  
No further galvanizing is required after fabrication if the spelter coating was not injured during shipping or erection.

**C. Acceptance**

See the requirements of AASHTO M 167M and M 36M.

**D. Materials Warranty**

General Provisions 101 through 150.

**844.2.04 Corrugated Steel Underdrain Pipe**

**A. Requirements**

1. Type  
For underdrains, use full-circle, galvanized, corrugated steel pipe that meets the requirements of AASHTO M 36M, Type III, or IIIA for the specified diameters.  
Determine the metal thickness according to the following table:

Nominal Inside Diameter inches (mm)	Thickness inches (mm)
6 (150)	.052 (1.320)
8 (200)	.064 (1.630)

Nominal Inside Diameter inches (mm)	Thickness inches (mm)
10 (250)	.064 (1.630)
12 (300)	.064 (1.630)
15 (375)	.064 (1.630)
18 (450)	.064 (1.630)
21 (525)	.064 (1.630)
24 (600)	.079 (2.000)

**B. Fabrication**

General Provisions 101 through 150.

**C. Acceptance**

See the requirements of AASHTO M 36M.

**D. Materials Warranty**

General Provisions 101 through 150.

**844.2.05 Precoated, Galvanized Steel Culvert Pipe****A. Requirements**

## 1. Type

Use precoated, galvanized steel pipe that meets the requirements of AASHTO M 245M for the specified sectional dimensions, plate thickness, and type of coating.

- a. Use special sections for these conduits, such as elbows and flared ends, that are the same plate thickness as the conduit to which they are joined and that meet the applicable requirements of AASHTO M 190M.
- b. Use the specified coating and invert paving.

**B. Fabrication**

1. Fully precoat or coat the coupling bands with bituminous material according to Subsection 844.2.02.
2. Furnish shop-formed elliptical pipe and shop-strutted pipe where specified.

**C. Acceptance**

See the requirements of AASHTO M 190M.

**D. Materials Warranty**

General Provisions 101 through 150.

**844.2.06 Aluminum-Coated (Type 2) Corrugated Steel Pipe****A. Requirements**

Use steel sheet for corrugated steel pipe that meets AASHTO M 274M requirements.

**B. Fabrication**

Fabricate corrugated steel pipe to the requirements of AASHTO M 36M.

**C. Acceptance**

See the requirements of AASHTO M 274M.

**D. Materials Warranty**

General Provisions 101 through 150.